

CLAIMS

What is claimed is:

1 1. A filter including a canister with a closed end and an opposite open end and ports
2 for receiving fluid to be filtered and for discharging filtered fluid; a central standpipe with
3 a distal free end toward the open end of the canister, the distal free end of the standpipe
4 having attachment means; a cover enclosing the open end of the canister and having a
5 central opening; and a filter element in the canister for filtering the fluid; and further
6 including an indicator handle assembly, the indicator handle assembly having a body
7 with: i) a collar extending through the central opening in the cover with corresponding
8 attachment means which cooperates with the attachment means of the standpipe, and a
9 handle which can be manually manipulated by an operator to attach the indicator handle
10 assembly to the tubular member; and ii) a device responsive to fluid pressure within the
11 filter canister, the device providing an indication of the fluid pressure in the canister
12 exceeding a certain value indicating that the filter element is spent and needs to be
13 replaced with a fresh element.

1 2. The filter as in claim 1, wherein the attachment means on the standpipe and the
2 attachment means on the collar each comprise threaded attachment means.

1 3. The filter as in claim 2, wherein the body is rotatable around a central axis to
2 screw the collar onto and off the standpipe.

1 4. The filter as in claim 1, wherein the body includes a central chamber with an
2 opening at one end into the canister which is fluidly connected with the canister.

1 5. The filter as in claim 4, wherein the fluid pressure responsive device is located in
2 the central chamber of the body.

1 6. The filter as in claim 5, wherein the fluid pressure responsive device is moveable
2 into multiple positions within the body, and the handle constrains the fluid pressure
3 responsive device to only axial movement in the body.

1 7. The filter as in claim 1, wherein the handle comprises a rod supported transversely
2 to a central axis of the body.

1 8. The filter as in claim 1, wherein the collar is unitary with the body.

1 9. The filter as in claim 1, wherein the body includes a transparent cap, and the
2 pressure responsive device can be visually inspected through the cap.

1 10. A filter including a canister with a closed end and an opposite open end, and a
2 cover enclosing the open end of the canister and having a central opening, the filter
3 including ports for receiving fluid to be filtered and for discharging filtered fluid, a ring-
4 shaped filter element received in the canister for separating contaminants from the fluid,
5 the canister having a central, axially-extending standpipe projecting from the closed end
6 of the canister, through the filter element towards the opposite open end of the canister,
7 the distal free end of the standpipe having a threaded portion; and further including an
8 indicator T-handle assembly, the indicator T-handle assembly having a body with: i) a
9 handle portion having a collar extending through the central opening in the cover and
10 having a threaded portion cooperating with the threaded portion of the central standpipe
11 to retain the cover on the canister, and a handle rod which can be grasped by an operator
12 and rotated to screw the indicator T-handle assembly onto and off of the central

standpipe; and ii) a mechanical indicator portion including a button responsive to fluid pressure within the filter canister, the button movable within the body to provide a visual indication of the fluid pressure in the canister exceeding a predetermined value indicating that the filter element is spent and needs to be replaced with a fresh element.

11. The filter as in claim 10, wherein the handle rod is supported transversely to a central axis of the body, and projects outwardly from the body for rotation by the operator.

12. The filter as in claim 10, wherein the body includes a pair of openings on opposite sides of the body, the handle rod being closely and tightly received in the pair of openings.

13. The filter as in claim 10, wherein the body has a central axis and the body is rotatable about its central axis to screw the collar into the standpipe, and the button is moveable along the central axis.

14. The filter as in claim 10, wherein the body has a central chamber with an opening at one end to the canister which is fluidly connected with the canister.

15. The filter as in claim 14, wherein the body also has an opening at another end, and further including a transparent cap removeably attached to the body and enclosing the opening at the other end of the body, and wherein the movement of the button can be visually confirmed through the transparent cap.

16. The filter as in claim 10, and further including an annular seal between the button and the body.

1 17. The filter as in claim 10, wherein the body has a central axis, and the button has a
2 slot elongated in the axial direction and extending radially through the button, and the
3 handle rod extends through the slot in the button and is supported by the body such that
4 the button has only axial movement within the body.

1 18. The filter as in claim 10, wherein the handle portion is integral with the
2 mechanical indicator portion.

1 19. The filter as in claim 10, wherein the collar is unitary with the body.

1 20. The filter as in claim 10, and further including a spring biasing the button into a
2 fresh element position, the button moveable against the spring into a spent element
3 position when the fluid pressure exceeds the predetermined value.

1 21. The filter as in claim 20, and further including a pair of catches on the button that
2 engage the body to retain the button in the spent element position.

1 22. The filter as in claim 21, wherein the catches can be manually manipulated when
2 the indicator T-handle assembly is unscrewed from the central standpipe to allow the
3 button to return to the fresh element position.

1 23. A handle indicator assembly for fixing a cover to a filter canister, the handle
2 indicator assembly comprising a body having: i) a collar which can be inserted through a
3 central opening in the cover and having means for attaching the collar to a central
4 standpipe in the canister, an internal passage through the collar to a central chamber in
5 the body, and a handle which can be grasped by an operator and manipulated to attach
6 the body to the central standpipe; and ii) an indicator device in the central chamber

7 responsive to fluid pressure received through the passage, and providing an indication of
8 the fluid pressure exceeding a certain value.

1 24. The filter as in claim 23, wherein the attaching means comprises screw threads.

1 25. The filter as in claim 23, wherein the fluid pressure responsive device is moveable
2 within the body, and the handle constrains the fluid pressure responsive device to only
3 axial movement in the body.

1 26. The filter as in claim 23, wherein the handle comprises a rod supported
2 transversely to a central axis of the body.

1 27. The filter as in claim 23, wherein the collar is unitary with the body.

1 28. The filter as in claim 23, wherein the body includes a transparent cap, and the
2 pressure responsive device can be visually inspected through the cap.

1 29. A T-handle indicator assembly, comprising a body with: i) a handle portion
2 including a handle rod with a threaded collar, an internal passage through the collar to a
3 chamber in the body; and ii) a mechanical indicator portion including a button in the
4 chamber responsive to fluid pressure received through the passage, the button moveable
5 within the body to provide an indication of the fluid pressure exceeding a predetermined
6 value.

1 30. The filter as in claim 29, wherein the handle rod is supported transversely to a
2 central axis of the body.

1 31. The filter as in claim 29, wherein the body includes a pair of openings on opposite
2 sides of the body, the handle rod being closely received through the pair of openings.

1 32. The filter as in claim 29, wherein the handle rod constrains the button to only
2 axial movement in the body.

1 33. The filter as in claim 29, wherein the body also has an opening at another end, and
2 further including a transparent cap removeably attached to the body and enclosing the
3 opening at the other end of the body, and wherein the movement of the button can be
4 visually confirmed through the transparent cap.

1 34. The filter as in claim 29, and further including an annular seal between the button
2 and the body.

1 35. The filter as in claim 29, wherein the body has a central axis, and the button has a
2 slot elongated in the axial direction and extending radially through the button, and the
3 handle rod extends through the slot in the button and is supported by the body such that
4 the button has only axial movement within the body.

1 36. The filter as in claim 29, wherein the handle portion is integral with the
2 mechanical indicator portion.

1 37. The filter as in claim 29, wherein the collar is unitary with the body.

1 38. The filter as in claim 29, and further including a spring biasing the button into a
2 fresh element position, the button moveable against the spring into a spent element
3 position when the fluid pressure exceeds the predetermined value.

1 39. The filter as in claim 29, and further including a pair of catches on the button that
2 engage the body to retain the button in the spent element position.

1 40. The filter as in claim 39, wherein the catches can be moveably manipulated to
2 allow the button to return to the fresh element position.